suppressive medication. Scheifley [3] reported a case occurring 12 months or more following the discontinuance of atabrine, and stated that he had been unable to find any reports of cases in which the clinical attack occurred more than eight months after exposure.

The following case, in which the delayed primary attack occurred 16 months after cessation of suppressive doses of atabrine, is reported primarily to call attention to the long time that may elapse before the onset of the first attack of clinically recognizable malaria.

CASE REPORT

A 28 year old male was admitted to Sutter Hospital, Sacramento, January 24, 1947, complaining of severe headache and fever of six days' duration. He had become ill after returning to his home from a skiing trip of about six hours' duration at 6,000 feet elevation. Headache, intermittent fever, and some general malaise were the only complaints. The following day he felt well enough to work, but developed fever and a chill and returned home. He was first seen the third day of the illness and nothing could be found on examination to account for the complaints. The next day he felt no different. Erythrocyte count and hemoglobin value were normal. The leukocyte count was 2,050, with a normal distribution. Sedimentation rate (Wintrobe) was 7.0 mm. in one hour. Except for 1 plus proteinuria, the urine was normal. The following day the leukocyte count was 9,000, with little change in the differential count.

The patient had served in the South Pacific from May, 1942, to September, 1945, and during this time had taken atabrine for suppressive purposes. He stopped all atabrine September 22, 1945, when he sailed for home. While in the Army he had had pneumonitis in Hawaii in 1942, mumps in Australia in 1943, and mild dysentery in New Guinea in 1944. He had never had any illness which even remotely suggested malaria.

Malaria was considered but in view of what seemed an unreasonably long latent period it was felt the patient was probably suffering from a virus infection of some sort, and hospitalization was advised. Repeated physical examinations were negative, except that the patient looked ill while he had fever, and seemed well when he did not. At no time could the spleen be felt. Whereas fever at first had been irregular, it soon became evident that chill and fever were coming fairly regularly every other day.

On the third day after admission blood smears taken three hours before another chill showed many trophozoites of the vivax type. Atabrine was begun at once, and the patient had one more chill of less severity two days later. The day after the trophozoites were found, more parasites were seen in a smear. This time most of them were in the ring stage. The patient had shown repeatedly a leukopenia (the leukocyte count having risen to 9,000 on one occasion only) and relative monocytosis; and at no time was there significant anemia.

The patient took a total of 2.8 gm. of atabrine, and was then told to take 0.6 gm. of quinine daily for eight weeks. However, because of severe hyperidrosis without fever, he discontinued the quinine after one week. He has not yet had a second attack.

COMMENT

There seems no reasonable doubt that this patient's attack of malaria came about as a result of inoculation in the South Pacific sometime (or repeatedly) in the period 1942-1945. Between the time of cessation of suppressive medication and the onset of symptoms there was a quiescent period of 16 months. Although the author knows of no reported latent period of this duration, others have indicated that even longer periods may not be rare. Walker [5] has knowledge of several cases in which overt vivax malaria did not develop until 12 to 15 months after discontinuance of suppressive atabrine, and Turner [4] has seen two cases in which clinical malaria developed two years after the patients had left the Pacific.

Change of altitude to a higher level has been found to precipitate an acute attack of malaria in a person seeded with the organism. The patient reported above developed the first attack a matter of hours after return from an elevation of 6,000 feet. Earlier in the day he had been practically at sea level. This was not, however, his first such trip. He had, in fact, made several skiing trips, and on one occasion had remained a week at high altitude. The factors responsible for precipitating the attack at this particular time remain unknown.

SUMMARY

A case of vivax malaria is reported in which there was a latent period of 16 months between the cessation of suppressive atabrine medication and the onset of the primary attack of the disease. Malaria must be considered in any patient with a febrile illness of unexplained cause.

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Friedreich's Ataxia with Unusual Heart Complications

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OF all the progressive diseases with a poor prognosis, Friedreich's Ataxia is one of the rarest. It is a familial, heredodegenerative disease [1] which occurs in children and has a fairly definite clinical picture and course. The characteristic symptom of the disease is ataxia. The patient gradually begins to walk on a broad base, has difficulty in climbing stairs, and stumbles or falls. The speech becomes slow, unclear and dysarthric, or there may be scanning and syllabilization. In some cases, the speech difficulty is the first symptom to attract attention. There are sensory disturbances of the lower extremity with impairment of position and vibratory sensation. Nystagmus is present, and clubfoot with marked arching of the foot produces chronic hyperextension of the big toe. Some cases show scoliosis in the thoracic area. The deep reflexes are usually absent but the Babinski is positive. Some patients show ataxic breathing, and often when the patient is seated in a wheelchair, the head bobs from side to side. Mentality is usually intact but it may be retarded.

Study of members of a family discloses the existence of incomplete or mono-symptomatic types; that is, there may be arched feet or nystagmus alone, or absence of reflexes.[2] Other symptoms in individuals are not merely abortive or atypical, but intermediate between symptoms of the disease and those of other diseases. Patients who have the disease gravitate to homes for the incurables or hospitals for chronic

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diseases, some living for 30 or 40 years after the onset in childhood. The disease is centered in the spinal cord [3] with degeneration of the pyramidal and dorsal spinocerebellar tracts. This combined degeneration of the posterior and lateral columns [4] becomes less marked as the tracts are traced upward. The cord is smaller than normal. The cerebellum shows a wide variety of changes, but in general there is degeneration of the ganglion cells.

The disease usually begins at the age of seven or eight, although sometimes after puberty. Brothers and sisters may be involved, and it may occur in many generations. The disease progresses inexorably until the patients are bedridden.

During the past year, the author has seen and examined three cases of Friedreich's Ataxia. In the progress of one case, the patient developed paroxysmal auricular tachycardia, which was resistant to treatment. Periodically the pulse rate would be increased only to revert to a lower rate after treatment. During one of the attacks of tachycardia, congestive heart failure developed and the patient died. While investigating the frequency of heart complications in Friedreich's Ataxia, the author came across the records of two sisters who were afflicted with the disease, one of whom developed a heart complication. Both were treated in this hospital. One died suddenly at the age of 27 and autopsy revealed an acute myocardial infarction.

CASE NO. 1

The patient, a woman 27 years old, entered the hospital on November 24, 1944. Interview elicited that she had first noticed trouble with writing at nine years of age. At age 12, she noted difficulty in walking. She had malaria at the age of 11 and was in bed for one year at that time. She was supposed to have a "leakage of the heart" which had begun before the age of nine and had taken medicine for this "heart trouble" while in grade school. She had had measles, chickenpox and whooping cough. Menses began at 14. The rest of the past history was negative.

Examination revealed a well-nourished young woman with a scoliokyphosis. There was bilateral exophthalmos. The heart was enlarged and a systolic murmur was heard over the precordium. The deep reflexes were absent in both lower extremities and the Babinski was positive. Nystagmus was present. Sphincter control was intact. The tuberculin test was negative. A diagnosis of Friedreich's Ataxia was made.

Occasional spells of vomiting were easily controlled. On March 20, 1945, severe dyspnea developed. The pulse was irregular, and the neck veins were distended. Upon administration of digitalis the dyspnea disappeared.

There was no further change in the condition until August 27, 1945, when one of the resident physicians noted a change in the patient's personality. Previously a very pleasant person, the patient now was constantly finding fault with everyone and was unkind to attendants. The pulse at this time was found to be irregular. On October 19, 1945, a severe pain in the right lower quadrant of the abdomen developed, without vomiting. As there had been no bowel movements for four days, an enema was given and the abdominal pain stopped. On October 27 there was a similar attack, but with vomiting, and although the emesis stopped following an enema, the temperature at this time was 101.2 F.

At 4 a.m. on October 28, the patient suddenly became very cyanotic and no pulse could be felt. Respirations were shallow and rapid and the heart sounds barely audible. The patient died at 8:30 a.m.

Autopsy revealed the following: The right lung weighed 450 grams and the left lung 300 grams. Both showed acute edema. The heart weighed 425 grams. The left ventricle was 15 mm. thick and the right ventricle 8 mm. thick. The tricuspid and pulmonic valves were normal. In the mitral valve there was some evidence of scarring of the leaflets and a slight nodular thickening at the bases, but no ulcerations or vegetations. The aortic valve was normal, and the ascending aorta showed a minimal amount of atherosclerosis. A small, friable blood clot was seen emerging from the left coronary ostium. With some difficulty it was removed, leaving a string-like thrombus traced to the bifurcation of the left coronary artery. When the heart muscle was dissected, an area at the apex was pale and blanched in comparison with the remainder of the ventricular wall. There was also some old scarring of the myocardium. The rest of the findings were negative except for a cyst of the right ovary.

Anatomical diagnoses: Acute pulmonary congestion and edema; cyst of the right ovary. On the basis of the heart findings, the autopsy surgeon added a probable coronary thrombosis to the anatomical diagnoses.

CASE NO. 2

A 21-year-old male patient who entered this hospital on October 31, 1944, had not walked for nine years. Past history disclosed that when examined at the University of California Hospital in March, 1935, at the age of 12, he had stated that the infirmity had been present for four years. He was markedly ataxic then, could barely walk, and had difficulty in speaking. A diagnosis of Friedreich's Ataxia was made and he was discharged from the University of California Hospital with instructions to report to the outpatient clinic there, which he did but once, on June 20, 1935. Thereafter the patient apparently had care from private physicians until his admission to this hospital.

At this time he could not walk, could barely sit up alone, spoke with a stuttering voice, but was euphoric. The deep reflexes were lost and there was also loss of bladder control. Routine care was given and the patient was up in a wheel chair daily. There was no change in condition for the next two years. He remained euphoric and often asked permission to try to walk with crutches or in a walker, but marked ataxia prevented this. When first seen by the author, the patient was still cheerful and hopeful that some treatment would be found to cure his condition so that he could start the study of medicine, which he yearned to do.

The family history was negative. There was no evidence of the disease in two younger sisters. Ataxic breathing was marked and sometimes the patient would scream or cry out in a loud voice for no apparent cause.

On October 4, 1946, abdominal pain developed. There had been no bowel movements for several days. This was remedied by enemas. Five days later, severe dyspnea developed, with a pulse rate of 190 which was lowered to 160 by ocular pressure. A tentative diagnosis of paroxysmal auricular tachycardia was made and was later confirmed by an electrocardiogram. The next day, when pressure over the eyeballs and carotid sinus failed to affect the pulse rate, which then was 180, a rapid course of intravenous digitalization was started.

Between this period and the time of death from congestive failure on December 18, 1946, the course was one marked by auricular fibrillation, bouts of regular rhythm, irregular respiration with variable response to therapy with digitalis and quinidine.

At autopsy, the meninges were congested, but the brain looked grossly normal. There was 300 cc. of fluid in each pleural sac. The left lung was edematous. The middle and lower lobes of the right lung were atelectatic and the upper lobe was edematous. The heart was enlarged and weighed 400 grams. The pericardium contained 120 cc. of pale yellow fluid. All valves, the aorta, and the coronary arteries appeared normal. The internal organs showed passive congestion.

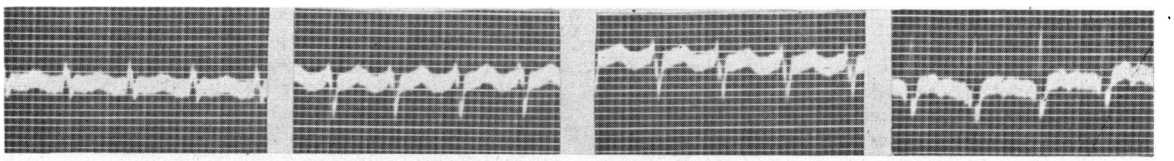

Figure 1. Case 2.—Standard leads October 10, 1946. Paroxysmal auricular tachycardia. Rate 180. Left axis deviation.

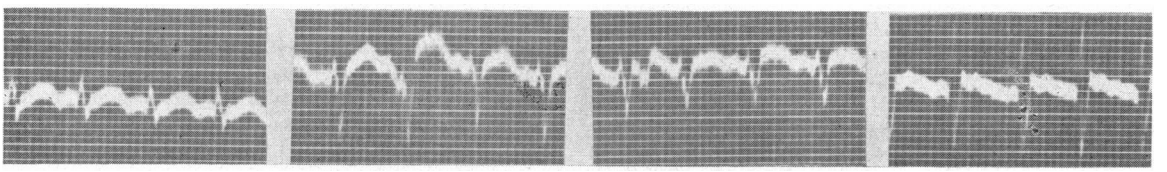

Figure 2. Case 2.—December 8, 1946. Rate 180. Left axis deviation. Evidence of myocardial damage present.

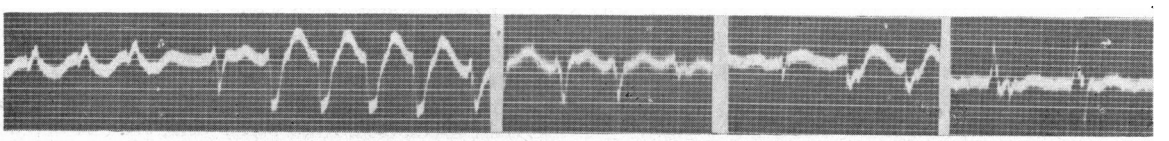

Figure 3. Case 2.—December 10, 1946. Note change of rate from 110 to 160. Patient on quinidine. In lead I note alternation of cycle length as described by Barker et al. and also abrupt change to paroxysmal ventricular tachycardia. Diffuse myocardial damage.

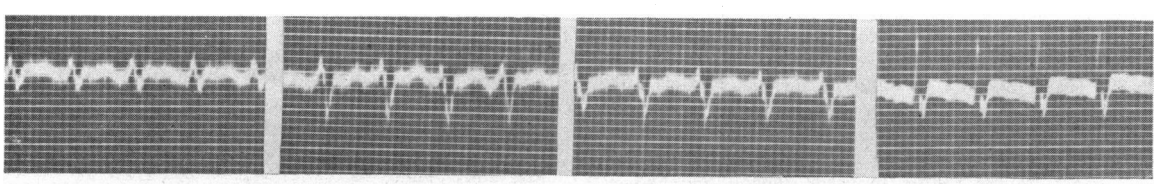

Figure 4. Case 2.—December 14, 1946. Rate 180. Left axis deviation. Reoccurrence of tachycardia. Note resemblance to Figure 1.

Anatomical diagnoses: Cardiac hypertrophy; atelectasis, right middle and lower lobes; pleural effusion, bilateral; pulmonary edema, bilateral. On microscopic examination, the liver showed severe chronic passive congestion. There was marked cardiac hypertrophy and diffuse interstitial fibrosis; the lungs showed chronic passive congestion and purulent lobular pneumonia. Sections of the cerebrum, cerebellum and spinal cord were not remarkable. In the medulla, the olivary nuclei contained numerous nerve cells with large, relatively clear vacuoles distorting the shape of the cells.

COMMENT

Two cases of Friedreich's Ataxia are reported. This condition, although rare, can usually be seen in hospitals for chronic diseases or in university hospitals which have a large turnover of patients. Diagnosis of a fully-developed case is not difficult, especially since in some cases there is a history of other members of the family being similarly affected. Difficulty in diagnosis comes in those cases which are not full blown, but are either incomplete or monosymptomatic, or abortive and atypical.

Patients with this disease may live for many years. However, cardiac complications may set in at an early age with death resulting. In Case No. 1 the outcome was a myocardial infarction in a woman 27 years of age, which is unusual. In Case No. 2, congestive heart failure developed following paroxysmal tachycardia in a man of 23 years of age. This patient died also.

Friedreich's Ataxia is a slowly progressive chronic disease which usually begins in childhood. Because very little is known of the causes, the physician can add very little in the way of treatment.

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